

SECTION 16133

CABLE TRAYS – SOLID BOTTOM TYPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes steel cable trays and accessories.
- B. Cable tray is for the express use of special system contractors. No other cable, other than low voltage cable associated with these systems may be pulled in this tray.

1.3 SUBMITTALS

- A. Product Data: Include data indicating dimensions and finishes for each type of cable tray indicated.
- B. Shop Drawings: For each type of cable tray.
 - 1. Show fabrication and installation details of cable tray, including plans, elevations, and sections of components and attachments to other construction elements. Designate components and accessories, including clamps, brackets, hanger rods, splice-plate connectors, expansion-joint assemblies, straight lengths, and fittings.
 - 2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 3. Seismic-Restraint Details: Signed and sealed by a qualified professional engineer.
 - a. Design Calculations: Calculate requirements for selecting seismic restraints.
 - b. Detail fabrication, including anchorages and attachments to structure and to supported cable trays.
- C. Coordination Drawings: Floor plans and sections drawn to scale. Include scaled cable tray layout and relationships between components and adjacent structural and mechanical elements. Show the following:
 - 1. Vertical and horizontal offsets and transitions.
 - 2. Clearances for access above and to side of cable trays.

- 3. Vertical elevation of cable trays above floor or bottom of ceiling structure.
- D. Product Certificates: For each type of cable tray, signed by product manufacturer.
- E. Manufacturer Seismic Qualification Certification: Submit certification that cable trays, accessories, and components will withstand seismic forces. Include the following:
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
 - b. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 - 2. Dimensioned Outline Drawings of Cable Tray Units: Identify center of gravity and locate and describe mounting and anchorage provisions.
 - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- F. Qualification Data: For testing agency.
- G. Field Test Reports: Written reports specified in Part 3.
- H. Operation and Maintenance Data: For cable trays to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- B. Source Limitations: Obtain cable tray components through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA VE 1, "Solid Bottom Type Metal Cable Tray Systems," if cable tray types specified are defined in the standard.
- E. Comply with NFPA 70.

1.5 COORDINATION

- A. Coordinate layout and installation of cable trays and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. B-Line Systems, Inc.
 - 2. Chalfant Cable Trays.
 - 3. GS Metals Corp.
 - 4. Mono-Systems, Inc.
 - 5. MPHusky.
 - 6. P-W Industries, Inc.
 - 7. Thomas & Betts Corporation.
 - 8. Cablofil, Inc.

2.2 MATERIALS AND FINISHES

- A. Cable Trays, Fittings, and Accessories: Steel, with the following finish:
 - 1. Hot-dip galvanized after fabrication, complying with ASTM A 123/A 123M, Class B2.
- B. Protect steel hardware against corrosion by galvanizing according to ASTM B 633 or cadmium plating according to ASTM B 766.
- C. Fabricate cable tray products with rounded edges and smooth surfaces.
- D. Sizes and Configurations: Refer to the cable tray detail on drawings for visual diagram.

2.3 CABLE TRAY ACCESSORIES

- A. Fittings: Tees, crosses, risers, elbows, and other fittings as indicated, of same materials and finishes as cable tray.
- B. Barrier Strips: Same materials and finishes as cable tray.
- C. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

2.4 WARNING SIGNS

- A. Lettering: 1-1/2-inch- (40-mm-) high, black letters on yellow background with legend "WARNING! NOT TO BE USED AS WALKWAY, LADDER, OR SUPPORT FOR LADDERS OR PERSONNEL."

2.5 SOURCE QUALITY CONTROL

- A. Perform design and production tests according to NEMA VE 1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABLE TRAY INSTALLATION

- A. Remove burrs and sharp edges from cable trays.
- B. Fasten cable tray supports securely to building structure as required.
 - 1. Locate and install supports according to NEMA VE 1.
- C. Make connections to equipment with flanged fittings fastened to cable tray and to equipment. Support cable tray independently of fittings. Do not carry weight of cable tray on equipment enclosure.
- D. Install expansion connectors where cable tray crosses building expansion joint and in cable tray runs that exceed 90 feet (27 m). Space connectors and set gaps according to NEMA VE 1.
- E. Make changes in direction and elevation using standard fittings.
- F. Make cable tray connections using standard fittings.
- G. Locate cable tray above piping unless accessibility to cable tray is required or unless otherwise indicated.
- H. Seal penetrations through fire and smoke barriers as required.
- I. Sleeves for Future Cables: Install capped sleeves for future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.
- J. Workspace: Install cable trays with sufficient space to permit access for installing cables.
- K. Cable tray is for the express use of low voltage, special system contractors only. No power, other than low voltage wiring, is to be installed in the cable tray.

- L. After installation of cable trays is completed, install warning signs in visible locations on or near cable trays.

3.3 CONNECTIONS

- A. Ground cable trays according to manufacturer's written instructions.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified testing agency to perform the following field quality-control testing:
- B. Testing: Engage a qualified testing agency to perform the following field quality-control testing:
- C. Testing: Perform the following field quality-control testing:
 - 1. After installing cable trays and after electrical circuitry has been energized, test for compliance with requirements.
 - 2. Perform the following electrical test and visual and mechanical inspections:
 - a. Visually inspect each cable tray joint and each ground connection for mechanical continuity.
 - b. Measure ground resistance of each system of cable tray from the most remote element to the point where connection is made to service disconnect enclosure grounding terminal. Record resistance in ohms.
 - 3. Report results in writing.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure cable tray is without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by cable tray manufacturer.
 - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by cable tray manufacturer.

3.6 CABLE TRAY SCHEDULE

- A. Run Designation: See drawings for cable tray locations and typical detail.
 - 1. Type: Solid Bottom.

2. Material and Finish: Galvanized steel.
3. Width: 12 in. unless otherwise noted.
4. Inside Depth: 2 in or 4 in as indicated
5. Cover Type: None.

END OF CABLE TRAYS – SOLID BOTTOM TYPE